# APPENDIX M Summary of Potential AOCs



# **APPENDIX M**

# **Potential Areas of Environmental Concern**

Site History Report – October 2004 Former Ingersoll Rand Company Facility Phillipsburg, New Jersey

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#### **APPENDIX M**

#### **Potential Areas of Environmental Concern**

Site History Report – October 2004
Former Ingersoll Rand Company Facility
Phillipsburg, New Jersey

This section describes the areas of concern identified during the preparation of this Site History Report. Pursuant to N.J.A.C. 7:26E-3.1 et seq. and the Preliminary Assessment (PA) form. This Appendix is structured to present the AOCs identified and recommendations for further action, where warranted in the same order as the PA-form. Figures identifying the locations of the AOCs identified herein are included as Figures M-1 through M-11. For ease of review recommendations are underlined.

As documented below, potential AOCs were identified in nearly every PA-category at locations across the site. Of the potential AOCs documented below, several have already been investigated as individual AOCs or historic investigations have taken place nearby that would address specific concerns associated with the newly identified potential AOCs. Other potential AOCs have been identified in areas which have not been previously investigated. Based on the complex nature of this site, extent of changes to the site and operations throughout site history, and the extensive investigation conducted to date, ENSR proposes that a detailed investigation into all potential AOCs identified at the facility pursuant to N.J.A.C.7:26E would not be appropriate or warranted and, as such, has included a request for variance in section 5.0 of the Site History Report text.

As documented in the Site History Report, ENSR has identified 15 groups of potential AOCs (Table 3 of the Site History Report) and has recommended additional investigation in areas that previously conducted activities may not have addressed.

As documented in the sections below, ENSR has proposed general investigations to be conducted on a grid-based sampling method as well as targeted AOC-based investigations. It is our intention that all proposed samples (unless otherwise noted) will be analyzed for priority pollutant plus 40 (PP+40) minus pesticides and herbicides. These additional investigations are proposed in an effort to address impacts across the site and to establish a basis for a site-wide deed notice.

# M.1 Bulk Storage Tanks and Appurtenances

As documented in the Site History Report, many ASTs and USTs were identified through review of site records. Since not all of these ASTs and USTs have been investigated, they were identified as potential AOC-54 (see Site History Report Table 3). Figure M-7 presents a map of all storage tanks identified in this Site History Report. It should be noted that AOC-41 (spill at the Brill Skimmer) is represented on this map in Building #104 with a separate location indicated for tanks found in that building. These tanks were not investigated during the investigation of the spill.



### M.1.1 Aboveground Storage Tanks (ASTs) and Associated Piping

As shown on Figure M-7, ENSR identified 41 areas with at least one identified AST. In the northeastern part of the site, four of these ASTs comprise the bulk storage AST farm and the current potable water AST which may have contained fuel oil at one time. Another possible tank was located just west of the AST farm near Building #104, and a spill in this area is addressed separately as AOC-41. Just south of Building #17, an unknown number of propane ASTs were located. No evidence of these ASTs remains and no surface staining was observed in these areas. No additional investigation is recommended. Additional AST areas in the northeastern part of the site include two former crude oil tanks, the foamite tanks in Building #18 and #18A, and a 600-gallon AST associated with the brill skimmer. The Brill Skimmer is already addressed as AOC-22. In the early 1990's the three remaining bulk oil storage ASTs were cleaned and thickness tests were conducted. Additionally, during investigations of AOC-38 (former fuel oil lines, see Appendix E), soil samples were collected in the vicinity of the current water AST, which was either formerly used for oil storage or is located within the former footprint of former oil tank #79. Soil samples did not indicate the presence of compounds in excess of applicable soil cleanup criteria. Based on the history of fuel storage in the current fuel oil tank farm (area with secondary containment), ENSR recommends a limited soil investigation in the bulk AST farm.

Three former ASTs were located in the Cameron area and reportedly contained fuel oil, oil, and "Mec" gas. Each of these ASTs was located outdoors and was operated from the 1960's or 1970's. It is unclear when these tanks were removed; however, the Cameron area was demolished during the early 1990's. In the northeastern area of the Cameron site south of Building #11, two possible ASTs were located. No evidence of these former ASTs remains and no additional investigation is recommended for these former ASTs.

In the southeastern part of the facility, along the eastern wall of Building #9, two tank areas and an associated piping area were identified. Along the southern wall, another tank area was located with 2 ASTs. Three ASTs were formerly located on the exterior of Building #11 adjacent to Building #9 and reportedly contained oil or kerosene. It is unclear when these tanks were in service and when they were removed from service. However, documentation indicates that they were installed over concrete slabs and much of the area around building #11 appears to be paved or concrete. A 1750-gallon AST of waste coolant was located south of Building #9, and has been addressed as AOC-21. No evidence of these ASTs remains and no surface staining was observed around Building #9 or #11. No additional investigation is recommended.

A unit containing a process AST is referred to in documentation found by ENSR as a Cutting Oil Tank and was located on the eastern wall of Building 12E. This is probably the same tank addressed by AOC-19 (air trappage tank). No additional investigation is recommended.



The remaining AST areas were located inside various facility buildings including Buildings #8, 9, 12, 25, 34, and 91.

Ten ASTs have been located inside the Powerhouse (Building #12) and contained various products including waste oil and coolant, to water treatment chemicals. Two of these locations have been identified as AOC-20. Another AST identified in Building #12 in the 1994 Draft RIWP was identified as AOCs 24. According to an analysis of sometimes conflicting documentation, it appears that the ultrafilter system may have contained several tanks, of which AOC-20 and AOC-28 were a part. This system was probably located in the northwest corner of Building 12. The ultrafilter may have contained both a partially underground 5000-gallon tank (likely AOC-20) and a 2000-gallon process tank unit (likely AOC-28) that were both part of the ultrafilter system. For the purposes of this report, the ultrafilter concentrate tank is referred to as an AST (likely AOC-20). AOC-20 received an NFA letter, and AOC-28 did not require sampling under ISRA. No ASTs remain in Building #12 and no staining or potential impacts were observed inside the building. As such, no additional investigation is recommended.

Five ASTs were located inside the former Building #91 and included lead solution, acids, and water – likely for the babbiting processes which occurred at this location. Building #91 was demolished in early 1990's leaving only its foundation. Building #91 was located in the center of identified AOC-3C and -3D (former metal chip pads), which have confirmed impacts of metals and BNs. Any impacts in this area have been addressed by sampling conducted for AOC-3C and -3D. As such no additional investigation is recommended

One AST was located in Buildings #9 and #34, respectively, and three were located in Buildings #8 and #25. One of the latter ASTs currently is present and operating at the facility in Building #25 as a condensate collection vessel for the new facility air compressors located nearby. This AST was installed within the last year and has secondary containment. No leaks or staining were observed. No additional investigation is recommended. Contents of the other tanks were undocumented or were coolants or other oils. It is unknown when these tanks were in service or when they were decommissioned. However, no evidence of these ASTs remains and no evidence of a release has been observed. No further investigation is recommended.

#### M.1.2 Underground Storage Tanks (USTs) and Associated Piping

As shown on Figure M-7, ENSR identified 33 UST areas where at least one UST was identified during ENSR's site history review.

In the foundry area USTs were identified at or near Buildings #2, 4, #74(G), and #76 (I). Two areas were located at Building #2 and contained rinse and leach tanks presumably associated with the core



preparation operations. One oil UST was located between Buildings I and G, was indicated in historical documents dated 1903. This tank was later converted to a paraffin UST and no longer appeared on facility records after 1922. A fuel oil UST was identified in or adjacent to Buildings #4 circa 1920 and was not identified again. All of these USTs are no longer in use and were likely abandoned or removed before the 1990's. No documentation of abandonment or removal was identified during the historical review. However, investigative activities have been conducted in the Foundry area in support of delineation of known impacts at AOC-17. Additionally, no groundwater impacts have been reported in this area. As such, ENSR recommends no further action for these potential UST locations. Impacts – if present – would be addressed by remedial activities being conducted under AOC-17.

In the main Cameron area, one UST location was identified from historical documents. This location was identified in a 1981 document as three USTs that may have contained oil. Additionally, two other USTs have been addressed as AOC-8 and AOC-26, which have received no further action determinations by NJDEP. ENSR understands that many USTs were removed in the 1980s but documentation was not readily available for review. Due to the potential presence of these USTs as well as the identification of many AOCs in the former Cameron area, ENSR proposes an area-wide investigation to be conducted on a grid-based sampling arrangement.

In the northern part of the site, an area with three oil tanks was located just east of Building #17 at the southwest corner of Building #82. Two 10,000-gallon USTs southwest of Building #17 have been addressed during previous environmental investigations as AOC-25. North of Building #17A, 3 concrete tanks were found and addressed previously as AOC-4. Environmental investigations for this former building have been conducted under AOC-16 and sampling, conducted on a grid pattern over the area of the former structure, identified areas of TPHC, BN, PCB, and metals impacts. No USTs or evidence of USTs were encountered during investigative activities. As such, ENSR recommends no further investigation into individual USTs in this area.

North of Building #17, two fuel oil tank areas were located near the IRTO Terminal (current Building #37). These tanks were excavated and disposed of offsite in the 1980s. <u>No further action is recommended.</u>

East of Building #17, an oil cooler UST was located outside former Building #23, presumably for use in the annealing department for heat treating operations. A buried waste carbide tank was also identified northeast of Building #23. Several other unspecified tanks (addressed in Section M.1.3) were also identified at or near Building #23. To date no sampling has been conducted in this area and no documentation of tank removal was available for review. A possible UST was also located at former Building #83. Northeast of Building 17 outside the northern wall of Building #83 a cutting oil house with a UST was located. Since Building #23 incorporated other operations of potential environmental concern, ENSR recommends that soil sampling is conducted on a grid pattern after the removal of soil from AOC-5 (located on the former foundation of Building #23).



West of Building #17, Building #21 possibly had two indoor areas that had specified underground tanks, though one of these areas (2-10,000 gallon tanks) is not identified on Figure M-7 because it was identified on NJDEP letters from the 1980s without location information. It is possible that this area is represented by one of the locations identified on the map, which had 2 or 3 USTs. A maintenance UST was also identified slightly northeast of Building #21. Additionally, a gasoline UST was identified on site maps from 1922 and 1933 near former Garage Building #24. This building was demolished in the 1970's and no documentation was uncovered indicating if the tank was abandoned or removed. Several other unspecified tanks (addressed in Section M.1.3) were also identified at or near Building #21. ENSR understands that many USTs were removed in the 1980's but documentation was not readily available for review. As such, ENSR recommends that soil sampling is conducted on a grid pattern similar to that proposed at Building #23 above.

South of Building #17, several USTs were identified at or near Buildings #7, #12, #13, #14, #22, and #29. The UST and associated piping identified southwest of Building #7 from a 1907 site map is currently occupied by Building #11. It is likely that the UST was removed prior to the construction of Building #11 and no further investigation is recommended. Another area with 2 USTs of hydraulic oil north of Building #8 appears to be AOC-15. The USTs identified near Building #12 have been addressed as AOC-9 and AOC-35. Three USTs at the east end of Building #13 are being addressed as AOC-7. Additionally, a fuel oil UST was located east of Building #12 and northeast of Building #29, which was reportedly used for locomotive refueling; this UST was abandoned in 1983 and has been addressed as AOC-9. West of Building #29, a 10,000-gallon fuel oil UST was also identified. A 5000-gallon UST was identified at the western corner of Building #22. Several USTs were associated with Building #14 and are being investigated under AOC-10, -11, -12, -13, and -14. As such, no further investigation is proposed. Investigations of other AOCs are continuing around Building #12 and any impacts of potentially remaining USTs will be addressed within those remedial activities.

#### M.1.3 Unspecified Storage Tanks and Associated Piping

As shown on Figure M-7, ENSR identified 103 areas with at least one tank that was not specified as being a UST or AST in the documentation reviewed. One of these (an area with in the foundry) was not mapped, because only the existence of tanks – and not their location – was identified in the document reviewed. In addition, some unspecified tank areas were already identified in Sections M.1.1 and M.1.2 as AOC-8, -9, 12, -13, -14, -15, and -19.

For the purposes of this Section M.1.3, the facility site was divided into northeastern, central, southeastern, northwestern, and southwestern areas. The extents of these areas are described in the subsequent sections. Twelve of these tank areas were in the northeastern part of the site, twenty-eight areas were in the northwestern part of the site, sixteen areas were located in the southwestern part of the site (Cameron complex), nineteen areas were located in the southeastern part of the main site, and twenty-seven were located in the central part of the site,.



#### **Northeastern Tanks**

The northeastern area encompasses the footprint of the former Building #17, all buildings north and east of Building #17. The northeastern area had tanks that stored a variety of materials, but mainly oil and process chemicals used in metal-working and metal plating processes. Process chemicals included parkerizing materials, acids, caustic soda, and brine. Oil-related tanks were identified in 4 northeastern unspecified tank areas, while process tanks were associated with 3 areas. The remaining 5 tank areas contained sludge, or unknown materials.

Five areas within or outside of Building #23 had tanks containing oil and process materials. Four areas inside Building #17 and #17B had tanks containing sludge, process or unknown materials. Three tank areas were identified around Building #37. It is possible that these tanks were already identified in Sections M.1.1 and M.1.2. ENSR understands that many tanks were decommissioned in the 1980s; however, documentation has not been recovered and could not be reviewed.

Former tank locations at and around former Building #17 have been addressed via sampling conducted at AOC-10 (former Building #14) and AOC-16 (Former Building #17) and no further investigation is recommended. <u>Based on the former presence of unspecified tanks, as well as other potential AOCs at or near former Building #23, ENSR recommends additional investigations consisting of soil sampling on a grid basis. ENSR also recommends that the tank areas identified around Building #37 be investigated to determine whether tanks may still remain in the areas.</u>

#### **Northwestern Tanks**

The northwestern area encompasses the former foundry locations and all buildings west of the western walls of Buildings #7 and 17 and north of Building #11 (Compressor Shop). The northwestern area had tanks that stored mainly oil (fuel oil, gasoline, and other oil for metal-working processes) and flammable gases used for welding (oxygen, propane, and possibly acetylene). Of the twenty-eight unspecified tank areas identified, 13 areas were oil or gasoline, 4 areas stored liquid oxygen, acetylene, or propane, 6 areas stored other process materials, and five areas contained unknown materials.

Many tanks containing oil or process materials involved in welding or metal working were located in the former foundry site. There were four process-related unspecified tank areas in or around Building #4. An area in Building #3's northern lean-to stored two 1-ton tanks of sulfur dioxide, which may have been used to produce sulfuric acid; however, no sulfuric acid tanks were identified in the northwestern area. One document from 1976 uncovered a layout for two bulk storage tanks (10,000 gallon and 15,000 gallon) in the steel and iron foundries. The location or contents of these tanks were not given, and thus these tanks have not been included on Figure M-7. Another two tank areas store oxygen and probably process-related materials north of Building #3. Four oil and gasoline tank areas were located in or along the west wall of Building #3. Two possibly process-related tank areas were located in



Building #30. A propane area was located south of Building #33 and south of Building #4. A gasoline tank was located off the southwest corner of Building #1.

North of the former foundry area, an oil tank was located in an open area between Building #24 and Building #4, two tank areas were located just west of Building #24 (garage), and two were inside Building #20. Seven tank areas containing oil and process materials were located in or just outside Building #21.

Since all of these unspecified tanks existed in the former Foundry area, which has been investigated as AOC-17, no additional investigation is recommended. Soil sampling within AOC-17 has identified soil impacts across the area; however, no groundwater impacts have been identified. Any impacts potentially associated with these former AOCs will be addressed under AOC-17.

Based on the former presence of unspecified tanks, as well as other potential AOCs at or near former Building #21 and the northern area of the former foundry division, ENSR recommends additional investigations consisting of soil sampling on a grid basis in each area.

### Southwestern (Cameron Complex) Tanks

Sixteen unspecified tank areas were located in the Cameron area. Nine of these areas did not have identified contents. Another three areas located near Buildings #252 and #261 and the Loading Shed were associated with metal working (cleaning, or inspection processes, dye penetrant, and magnaflux). Three areas were indicated as oil-related, one of which was a separator located in Building #258, while the remaining two areas were located south of Building #254 and near Building #255. One tank area in Building #251A contained an oxygen tank with a four-foot diameter.

Since these and other ASTs and USTs were present in the Cameron area and have generally not been addressed, ENSR recommends additional investigation in the Cameron area to be conducted on a grid sampling basis.

#### **Southeastern Tanks**

Nineteen unspecified tank areas were located in the southeastern part of the site. The greatest concentration of tank areas was in Building #91, which contained six tank areas for flux, lead, tin, solder, rinse-acid-alkaline, and an unknown material. Four interior tanks were located mainly in Buildings # 8, 10, and 25. Two oil tanks were possibly located on the east wall of Building #11. Two possibly oil tank areas were located along the east and southern walls of Building #9. A 55-gallon drum containing kerosene was identified northwest of Building #28, while two possible oil tank areas and a nozzle tank area were located north of Buildings #8 and #25.



Former tanks that were identified at the former Building #91 are located in the center of AOC-3C and 3D that has confirmed impacts of metals and BNs. Any potential impacts from tanks at Building #91 have been addressed by sampling conducted for AOC-3C and -3D, and no further investigation of tanks is proposed at this location. Former tanks in Buildings #8, #11, and #25 do not appear to have been addressed. As such, ENSR recommends a more thorough review of these tanks to determine if additional sampling is required.

Finally, a tank was identified on a 1977 map of Building #105. This UST is located in the same area as AOC-21 (a waste-oil AST) and may have been constructed as an AST. <u>ENSR recommends a review</u> of documentation to confirm.

#### **Central Area Tanks**

The central part of the site is south of Building #17 consists of the outdoor area between Buildings #7, #8, #12, #13 and includes Buildings #7, #12, #13, #14, #15, #16, #19, and #29, as well as the area east of these buildings, including the bulk tank farm.

The greatest concentration of tanks in the central section of the site was located in or just outside of Buildings #14 and #15. Eight tank areas were located in or around Building #14, including tanks containing oil, brine, gasoline, and unknown process materials. Five tank areas were located in Building #15 that contained chromium, oil, and unknown process materials. Just to the west of these buildings, two oil separators were also located in Building #7, a tank of unknown contents was located near the southeast corner of Building #7, while in the northern part of the Building #7 a paint tank was identified.

Four unspecified tank areas were located in Building #13, three of which contained oil, while the fourth contained two tanks with unknown contents. A tank area was located in the original Building #18, which was north of the original northern wall of Building #13 (now Building #19). An oil tank was located at the northeast corner of Building #16.

Former tank locations at former Buildings #14 and #17 have been addressed via sampling conducted at AOC-10 (former Building #14) and AOC-16 (Former Building #17) and no further investigation is recommended. Former unspecified tank locations Buildings #7, #13, #15, #16 may not have been addressed adequately. ENSR recommends a limited investigation at these locations to assess soil quality near the locations of the former tanks in instances where sampling has not been conducted to date.

In the northern part of the Powerhouse, a boiler blowdown tank was located. This tank likely discharged through the ultrafilter and is no longer present as the Power House is not in operation. East of Building #12A, a tank labeled "G-6" was identified. This tank is likely the Air Trappage Tank that has been addressed as AOC-19. No additional investigation is recommended.



South of AOC-19, two tank areas were located in the open area between Buildings #12, #13, and #29 and contained fuel oil. A waste coolant tank was located in Building #18. Environmental investigations for Building #18 will be included in the <u>limited soil investigation recommended in Section M.1.1 for the bulk AST farm.</u>

#### M.1.4 Silos

ENSR identified 8 locations in which silos or bulk storage bins were located at the Ingersoll Rand facility. For the purposes of this report these areas were assigned to AOC-60 and are shown on Figure M-11. Five of these were located in the former Foundry area and contained foundry sand for use in casting operations. Another sand silo may have been located in the Drill Division's Building #17B. The remaining two silos were located at the power house and contained ash. Based on previous investigations, spent foundry sand has been identified as potential fill material in several areas of the site (see M.4.7 and Appendix L) and has been reported to be impacted with BNs and metals. The former foundry buildings (AOC-17) have been investigated and soil analytical results indicate similar impacts. Sand located in the silos was likely virgin and unimpacted. ENSR recommends no further investigation into the sand silos in either the former foundry locations or Building#17B. Potential spent foundry sand related impacts in the Foundry area are addressed under AOC-17.

Facility documents indicate that boiler ash stored in the silos at the Power House was placed in the landfill during the course of facility operation until sometime in the 1970s when the facility began offsite disposal. The Old Landfill is being addressed as AOC-29 and investigations have been conducted in the vicinity of Building #12 at AOCs-1, -9, -11, -12, -13, -14, -19, -35, and -38. Based on the investigations conducted to date, ENSR recommends no additional investigation in the vicinity of Building #12.

#### M.1.5 Rail Cars

No documentation was available to document the presence of bulk storage rail cars. However, it is likely that various products – including fuel oil and other materials - used and stored on the site were transported to the site by rail. For the purposes of this report, this potential area of concern was assigned to AOC-55. Based on the extensive network of rail tracks that have formerly been present at the facility and no documentation of any parking, storage, or loading locations for such rail cars, no sampling specifically related to the presence of rail cars is recommended. Based on the sampling conducted during previous investigations as well as the sampling proposed in other sections of this report, potential impacts related to the bulk storage rail cars which may have been present across the site will be addressed. As such, no additional investigation is proposed.



# M.1.6 Loading and Unloading Areas

Loading and unloading of various materials were conducted at locations throughout the facility and are not specifically identified in this report. Previous investigation, as well as additional investigations proposed in this report, will address potential environmental concerns in these areas. As such, no additional investigation is recommended.

#### M.1.7 Piping, Above Ground and Below Ground Pumping Stations, Sumps and Pits

For the purposes of this report, piping, pumping stations, sumps and pits related to tanks were assigned to AOC-54 and are presented on Figure M-7.

Aboveground piping for the bulk AST-farm was installed in the 1980's and the Bulk AST farm was decommissioned in 2000. During that time no leaks or evidence of discharge was documented. <u>No additional investigation is recommended.</u>

Underground piping from the AST farm has been investigated as AOC-38, which has been detailed in Appendix E. As such, no additional investigation is recommended.

Underground piping was likely present for many of the other tanks identified at the site. Based on the investigations conducted to date and those proposed in this report, <u>no additional investigation into specific piping is recommended.</u>

A covered concrete pipe trench referred to as the "subway" was historically located at the facility and remains in many portion of the site. Due to the deteriorating conditions, entry is limited. <u>However, based on a recent visual inspection, no environmental issues were observed. ENSR recommends no further investigative action.</u>

Pumping stations, sumps, and pits have been documented at the site in association with several of the above referenced ASTs, USTs, and unspecified tanks. <u>These features, where present will be addressed in association with their respective tank (see M.1.1, M.1.2, and M.1.3). As such ENSR does not recommend further investigation under this section.</u>

#### M.2 Storage and Staging Areas

As documented in the Site History Report, many storage and staging areas were identified through a review of site records. Potential coal storage was identified as AOC-46, while chemical, drum, waste, or other storage was assigned to AOC-60 (storage pads, storage areas, and process areas). Areas identified under this Section are depicted in Figures M-1 and M-11, respectively.



# M.2.1 Storage Pads Including Drum and/or Waste Storage

For the purposes of this report storage pads were assigned to AOC-60. ENSR identified 41 storage areas, excluding two hazardous storage areas addressed in M.5.2. Four storage areas were located in the foundry area based on historical records. One, located inside Building #3, was used as a waste storage area; another, south of Building #4 was used for scrap metal storage; another area with bins and a trestle to the east of Building #4 may have been used to store metal stock; the last area, located inside Building #4 was used to store fire clay, possibly for ceramic core preparation. ENSR proposes that the northern area of the former foundry division be investigated on a grid sampling basis in order to address concerns related to the former operations in that area. Based on the sampling conducted in the southern part of the foundry area during previous investigation of AOC-17, potential impacts related to these former storage areas have been addressed. As such, no additional investigation is proposed.

Fifteen storage areas were located at various locations across the former Cameron area at the southwestern portion of the facility, including the previously identified chip storage pads (AOC-3A/3B) and the Cameron coolant disposal area (AOC-6). Storage included scrap, raw materials (i.e., brass, steel, and iron), and castings storage. Since these storage areas (as well as many other potential AOCs) were present in the Cameron area and have generally not been addressed, ENSR recommends additional investigation in the Cameron area to be conducted on a grid sampling basis.

In the main facility area, nine former storage areas were located north or east of Building #17 and included storage and scrap pads for empty drums, waste, oils and solvents, and scrap metal. Based on the locations of each of these areas, previous soil investigation has addressed potential impact including the prior identification of two of these pads as AOC-3E and 3F. One pad, however, located at the northeast corner of former Building #23 has not been addressed by any sampling effort. Since Building #23 incorporated other operations of potential environmental concern, ENSR recommends that soil sampling is conducted on a grid pattern after the removal of soil from AOC-5 (located on the former building foundation of Building #23).

To the west of Building #17, two former storage areas were identified, one in Building #20 and the other in former Building #5. These were identified as storage areas and were presumably used for storage of materials used in operations at those buildings. <u>Based on their location within buildings, constructed on concrete slabs, and the relative inability for potential impacts to the surrounding environment, ENSR recommends no further investigation.</u>

The remaining eleven storage pads identified were located south of Building #17. Two were located inside Building #13, one was located north of the original Building #13, and one was east of Building #13. Further south, two were located inside Building #11, and one was located outside the corner of Buildings #7 and #8. Three were located south of Building #9, including a solvent storage shed, and the previously identified chip pads (AOC-3C/3D). Another previously identified possible storage area



was located south of Building #17, specifically a scrap pad south of Building #24 (AOC-39). Based on their locations and sampling conducted in the vicinity of these storage areas, it is unlikely that potential impacts from these locations – if present – have not been identified. As such, no further investigation is proposed at all locations except for a former lubricating oil store room which was located at the corner of Building #7 and #8. ENSR recommends the installation of one soil boring to assess soil quality at this location.

Two hazardous waste storage sheds located east of Building #12 and south of Building #9, respectively are addressed in Section M.5.2.

#### M.2.2 Surface Impoundments and Lagoons

Based on historic review, four inverse ponds, a Spray Pond, two fire ponds, a stormwater detention basin, and several sinkholes were historically located on the facility property. These features are discussed in M.3.7.

#### M.2.3 Dumpsters

Locations of past site dumpsters were not identified during ENSR's file review. Based on internal correspondence, all non-hazardous waste since at least the 1970s has been disposed of offsite. Appendix I details facility disposal practices during operations.

Currently, there is a general trash dumpster located outside of Building #16 on its eastern side for trash from Stateline Steel Fabricators. A trash dumpster for Village Bus has been observed north of Building #37. Additional dumpsters are located near Building #20 for current Flow Serve operations. <u>Based on identified environmental impacts at the site, ENSR does not believe an additional investigation into dumpster locations is warranted. Based on sampling conducted to date, and additional sampling proposed in this report, potential impacts related to the use and operation of dumpsters at the facility will be addressed.</u>

#### M.2.4 Chemical Storage Cabinets or Closets

ENSR identified 3 chemical storage cabinets or closets in buildings during a review of historical documents. Two were located in former Cameron Area buildings and one was located in foundry Building #60. Investigation has already been proposed in the Cameron area on a grid sampling basis, which would incorporate the locations of two of these chemical storage areas. The location of the third chemical storage area in the former foundry has been investigated with previous sampling efforts. Based on identified environmental impacts at the site, ENSR does not believe an additional investigation into these locations is warranted. Based on sampling conducted to date, and additional sampling proposed in this report, potential impacts related to the use and operation of chemical storage cabinets or closets at the facility will be addressed.



### M.2.5 Coal storage and handling areas

ENSR identified twelve potential coal storage areas during document review and will address all former coal storage areas as AOC-46. Two of these identified AOCs were train trestles over which coal was dumped from rail cars to open storage areas below. The primary coal trestle was identified by the facility as Building #88 and was located on the eastern side of the facility, south of the main bulk oil storage tank farm. The coal trestle was constructed in 1917 and rose to approximately 30 feet in height. This main trestle was removed between 1974 and 1981 leaving only the concrete foundation buried under fill. ENSR has begun investigative activities at this location to assess any potential impacts in this area.

Based on maps from the 1920's another coal trestle (also labeled coal pocket) was located north of the former Cameron powerhouse (Building #251). This trestle appears to have been located in the same area as a former chip storage area located east of Building 252 (AOC-3A), which received an NFA letter from NJDEP. Regardless, due to the presence of several previously unidentified potential AOCs in the Cameron area, ENSR has proposed additional investigation to be conducted on a grid pattern.

In the main facility area, other coal storage areas were identified in the northern part of the facility (outside Building #31), in the southern area of the iron foundry (Building #4), and east of Building #14. The powerhouse (Building #12) contained an elaborate indoor and outdoor coal-related system that included crusher pits, conveyors and suspended bins to deliver and store coal. By 1933, a coal shed with concrete floors (Building #12B) had been built in the gap between the southeastern corner of Building #12A and the northeastern corner of Building #12. Because no investigative activities have been conducted in the area around Building #31, ENSR recommends that one soil boring be taken at the location of the identified coal box. Based on sampling conducted to date, and additional sampling proposed in this report, potential impacts related to the use and operation of the other coal storage and handling areas in the main facility area will be addressed.

# M.3 Drainage Systems and Areas

# M.3.1 Floor Drains, Trenches and Piping, and Sumps

A total of 61 floor drain, trench, and sump locations were located during ENSR's file review, some with multiple features in one location. Floor drains, trenches, piping, and sumps existed in multiple areas of the facility, and based on documentation and drawings reviewed by ENSR, it is likely that most of them lead to the sanitary sewer system. For the purposes of this report, floor drains, trenches, piping, and sumps in buildings were assigned to AOC-52. A document dated in 1973 addressed to the EPA indicates effluent from the Drill and Compressor Divisions may have drained to Lopatcong Creek (via the Spray Pond and Inverse Ponds). Based on ENSR's file review, at least 38 areas contained floor drains, trenches, piping and sumps. However, detailed building drawings were not available for all structures and the presence of these structures in site buildings was likely ubiquitous. A detailed



review of these floor drains, trenches, piping, and sumps was not completed due to the extensive nature and lack of historical documentation available. Appendix J details waste water discharges at the site based on documentation consulted during ENSR's file review.

Based on historical records, 25 pits and 14 sumps inside buildings across the facility were identified that may have received wastewater associated with building operations. Because 22 of the pits were associated with process areas, they have been assigned to AOC-60. Sumps were assigned to AOC-52. During site previous site investigations two pits were identified in Building #16 and were investigated as AOC-45.

Based on the sampling conducted during previous investigations, as well as the sampling proposed in other sections of this report, potential impacts related to the floor drains, trenches, piping, pits, and sumps located inside buildings across the site will be addressed. As such, no additional investigation is proposed.

#### M.3.2 Process Area Sinks and Piping that Receive Process Waste

Multiple buildings may have used process area sinks and piping that possibly received process waste, these likely drained to the sewer system or the ponds located in various locations at the site. These areas have been assigned to AOC-52 for the purposes of this report. Based on ENSR's file review, only two areas were identified as having process sinks and piping. The neutralizing area in Building #12 contained pipes leading to the sewer and the Spray Pond; the chemical lab in Building #20 contained a sink that drained to a vitrified clay sewer pipe that led to the sanitary sewer system.

Through review of documents and as indicated above, process area sinks and piping which receive process waste were identified in only a few buildings. However, based on the processes conducted in various locations at the site, additional process sinks are expected to have been present. Due to the lack of historical documentation, a detailed review of these sinks and piping was not completed.

Based on the sampling conducted during previous investigations as well as the sampling proposed in other sections of this report, potential impacts related to the process areas sinks and piping which receive process waste located across the site, will be addressed. As such, no additional investigation is proposed.

#### M.3.3 Roof Leaders When Process Operations Vent to the Roof

It is probable that multiple buildings on the site had roof leaders. For the purposes of this report, these areas were assigned to AOC-59. Several maps identified during the historic document review show the location of stacks and vents throughout the facility. Through review of available documentation, only one reference to a roof leader was identified; although it is likely many of the onsite buildings



contained roof leaders or other roof drainage systems. Due to the lack of available historical documentation, a detailed review of these areas was not completed.

However, based on the sampling conducted during previous investigations as well as the sampling proposed in other sections of this report, potential impacts related to roof leaders located across the facility will be addressed. As such, no additional investigation is proposed.

#### M.3.4. Drainage Swales & Culverts

There are no current drainage swales or culverts present at the site. A historic document review also did not indicate the presence of these structures at the facility. As such, no further investigation is recommended. A drainage ditch which channels water discharged from the southern Inverse Pond off the facility property across the southern farm fields, and to the Lopatcong Creek was previously identified as AOC-37 (Ephemeral Stream). A NFA was issued by NJDEP for this AOC in 2002.

#### M.3.5 Storm Sewer Collection Systems

As previously indicated, the onsite storm sewer line system is complex; drains and catch basins are located across the site and are divided into separate areas which divert stormwater to different locations on site. Storm sewer infrastructure was assigned to AOC-53 for the purposes of this report. Drains in the western portion of the site generally lead to the northwestern retention basin. Drains on the eastern portion of the site generally lead to the Spray Pond. Drainage from the northeast and north central section of the site was formerly discharged to the ground surface near the facility boundary and now may be abandoned or connected to the Spray Pond and Inverse Pond system. The southern buildings in the compressor division apparently were historically drained to ground surface at a location beneath the current Old Landfill (AOC-29) and may now be abandoned or connected to the Spray Pond and Inverse Pond system. Also, as indicated on the 1947 storm sewer map, there was a valve located between Building #14 (Heat Treat) and Building #8 (Compressor Erecting) that allowed the storm water to flow to be discharged into the sanitary system. In the 1980s, according to a 1986 Capsule Laboratories Waste Disposal Cost Reduction Program Update Questionnaire, the storm water system appeared to have discharged into the sanitary system. Presently, the storm sewer system is divided across the site, areas located west of Building #7 (Shipping and Receiving) drain into the retention pond west of the former foundry, then to the Philipsburg storm sewer network. Stormwater runoff on the eastern side of the plant is channeled into the Spray Pond, which discharges to the inverse ponds, to the ephemeral stream, and finally into Lopatcong Creek.

Appendix H contains a summary of building activities across the site. Where documentation was available, ENSR referenced known floor drains, trenches, catch basins, and contact and non-contact cooling water discharge locations.



Based on the sampling conducted during previous investigations as well as the sampling proposed in other sections of this report, potential impacts related to storm sewer collection systems located across the site, will be addressed. Additionally, the onsite ponds, which currently and formerly were part of the stormwater collection and discharge system, have been identified as AOCs and are being investigated as appropriate. No additional investigation related to onsite stormwater collection and discharge is proposed.

#### M.3.6 Storm Water Detention Ponds and Fire Ponds

Based on historic review, four inverse ponds, a Spray Pond, two fire ponds, a stormwater detention basin, and several sinkholes were historically located on the facility property. The onsite ponds are discussed in M.3.7.

#### M.3.7 Surface Water Bodies

Historically at least seven man-made ponds have been present on site, and two ponds created by sinkholes were identified in historic records. Water bodies not previously identified were assigned to AOC-51. Four ponds were previously located on the western side of the facility. Review of the aerial photographs and the NJDEP GIS, indicate that the northern two ponds (previously identified as AOC-32) were previously used as fire ponds and were equipped with inverted discharge pipes to prevent any oil released to the pond to be discharged to the sanitary sewer system. These ponds were excavated in the late 1980's and the land was subsequently developed into a larger stormwater detention basin with a smaller retention pond near the discharge. The other two ponds on the western side of the facility were located to the southwest of Building #1. These ponds appears much smaller than other ponds identified at the site but historic records indicate that stormwater was discharged to these ponds and that each pond featured an inverted discharge pipe to prevent oil from being discharged from its confines. These ponds were removed during site alterations in the 1980's. The former northwest Inverse/Fire Ponds that were removed and replaced with a single stormwater detention pond have been addressed as AOC-32. Additionally, sampling has been conducted at the perimeter of these former ponds in the effort to delineate AOC-17. Impacts identified around the detention basin were consistent with the spent foundry sand used to fill this area. As such, ENSR does not recommend any additional investigation into these former ponds or the current stormwater detention basin. However, the two smaller ponds formerly located southwest of Building #1 have had no investigative activities conducted at or near their former location. As such, ENSR recommends that one soil boring be conducted at each of the former pond locations to assess potential impacts at these locations.

At least three ponds have been located at the eastern side of the facility.

Since its construction circa 1905, the Spray Pond has historically received waters from stormwater runoff, non-contact cooling water recirculation, and batch water from pump testing, as well as



powerhouse boiler water. Water exceeding the pond's capacity has always been discharged by way of an overflow pipe to downstream areas, ultimately arriving at Lopatcong Creek. One drain is known to exist for the pond. Another, shown on 1905 plans for the pond, is not known to currently exist.

The spray pond remains in use at the facility as a receptacle of non-contact cooling water and storm water, and currently discharges to two Inverse Ponds located southeast of the Spray Pond. The Spray Pond is being addressed as AOC-30 and investigations conducted at this location have been detailed in Appendix E. <u>ENSR recommends no additional investigation.</u>

Two inverse ponds are currently located southeast of the Spray Pond and accept its discharge via an underground pipe. Additionally, the Inverse Ponds accept stormwater collected from within the secondary containment structure around the bulk AST-farm. These ponds are equipped with inverted discharge pipes to prevent the discharge of oil into the drainage ditch (ephemeral stream) that leads to Lopatcong Creek. These ponds are being addressed as AOC-31, investigations have been conducted at these locations, and additional investigation and remediation has already been proposed. Details related to these ponds were included in Appendix E.

Due to the karst-like geology of the region, sinkholes have historically been documented at the site. While these sinkholes generally do not pose an environmental concern, several sinkholes have retained water for a short period of time until facility personnel filled the depressions. It is unclear how the depressions were filled. Two sinkholes that appeared to have retained water were documented east of the Spray Pond and appear to have accepted discharge from the Spray Pond. These former sinkholes are no longer evident at the site as they were filled upon the construction of Loop Road, which is present on the eastern side of the Spray Pond. Since these sinkholes were part of the discharge from the Spray Pond to the Inverse ponds, both of which are considered AOCs requiring investigation, these sinkholes should be addressed as AOCs as well. However, because they have been closed and buried under approximately 10-feet of fill, areas of which are steeply sloped, ENSR does not recommend individual investigation of these sinkholes. However, since AOCs with known impacts are located around this area, ENSR recommends that the area of these sinkholes be placed under deed restriction along with nearby AOCs.

At the southeastern corner of the facility, the southern Inverse Pond discharges into a drainage ditch commonly referred to as the ephemeral stream. This feature was previously investigated as AOC-37 and has received NJDEP concurrence that no further action is necessary. Previously conducted activities are detailed in Appendix E. No further investigation is recommended.

# M.3.8 Septic Systems, Leachfields, or Seepage Pits

Based on historical documentation, there was a partial sanitary sewerage system during early facility operations but several areas at the site had cesspools and septic tanks. No leachfields were identified. These potential areas of concern were assigned to AOC-50 and are shown on Figure M-5. Six



cesspools were located at the facility; one cesspool was located in the area between Buildings #29, 13, and 28, two were located in the area north of Building #23, one was west of Building #23, one was north of Building #17 (in what is now Building #17A), and one was west of Building #11 (Compressor Shop).

Based on historical documentation, six septic tanks were located southeast of Building #13 (Machine Shop) and northeast of Building #29 (Locomotive House). These septic tanks were encountered during an investigation of fuel oil pumping in the 1990's and were removed, according to the 1995 report titled, <u>Status of Remedial Investigation/Remedial Action on the Buried and Abandoned No. 2 and No. 6 Fuel Oil Lines</u>, prepared by Tellus Consultants. The documentation reviewed labeled one of the cesspools north of Building #23 a possible septic tank.

ENSR recommends that the locations of these former structures be assessed and that one soil boring is conducted at each location to verify soil quality and to assess if these structures remain at the site.

Presently, all sanitary discharges are diverted into the site sanitary sewer, which discharges to the Phillipsburg sanitary sewer network, which is finally received by the Phillipsburg Sewer Utility (PSU).

#### M.3.9 Drywells and sumps

Drywells and exterior sumps were assigned to AOC-50 and are shown on Figure M-5, except for the chip discharge area outside Building #9, which was assigned to AOC-60 because it was associated with a specific process. ENSR identified 1 potential drywell, and at least 13 exterior pits, catch basins, or sumps were found in multiple areas of the facility. ENSR proposes to identify and investigate unlined sumps where identified at the site with the advancement of one soil boring at the downgradient edge of the sump.

Additionally, as indicated above, one drywell and associated catch basin was identified to the west of Building #11 and south of Building #6 and does not appear to have had investigative samples previously conducted or proposed nearby. As such, <u>ENSR recommends that this feature is located and borings and soil sampling are conducted per N.J.A.C.7:26E to verify soil quality at that location</u>.

# M.4 Discharge and Disposal Areas

# M.4.1 Areas of Discharge

Based on a review of historic facility records several spills and discharges have likely occurred at various locations around the facility. As documented in Appendix C, the site has been identified in the NJ spill/NJ release databases for past events that have been reported. Of 6 Spills and 2 Releases, all appear to have been addressed by facility personnel or as an area of concern (specifically AOC-2, -30, -31, -38, and -41). Since no locations were provided or are documented in facility records and no other



specific area of discharge was identified during review of historic documents, <u>no further investigation is proposed.</u>

#### M.4.2 Waste Piles

According to a 1953 drawing, a trash dump was located east of Building #13 and in the vicinity of former scrap metal bins. For the purposes of this report, this area was assigned to AOC-60. It is not known what material was placed there but review of aerial photographs cannot confirm its existence. No confirmation of the existence of a trash dump at this location was identified. Additionally, previous investigative sampling conducted in the area (AOC-35 and -38; see Appendix E) has not identified waste material. As such, no further investigation is recommended.

# M.4.3 Waste Water Collection Systems Including Septic Systems, Seepage Pits, & Dry Wells

Through review of historic records several waste water collection systems including septic systems, Seepage Pits, & Dry Wells were identified at the site. However, these features have been identified and addressed in Section M.3.8.

#### M.4.4 Landfills or Landfarms

Two landfills currently exist at the southern end of the facility property. A discussion of these old and new landfills can be found in Appendix I and L in the discussions of waste disposal practices and landfilling, respectively. For the purposes of this report, unidentified fill material and the new landfill were assigned to AOC-58, while the old landfill was addressed by AOC-29. Contaminated soil piles located east of Building #17B and south of Building #111 were addressed as AOC-5 and AOC-36.

As described previously, the old landfill (AOC-29) is located to the southeast of the facility's manufacturing buildings and south of the Spray Pond. The old landfill was the only location for disposal of plant waste materials for approximately 60 years. Material placed in this landfill is more thoroughly described in Appendix I. The old landfill is being addressed as AOC-29 and has received conditional no further action for the portions south of Loop Road. Based on historical documentation and soil characterization from soil borings in the area, the northern limits of the Old Landfill have been estimated and share borders with other nearby AOCs including the Spray Pond (AOC-30), the Inverse Ponds (AOC-31), and former chip pad locations 3C and 3D (AOC-3C/3D). As such, ENSR proposes no additional investigative activities.

The new landfill, located west of the Old Landfill, operates as a permitted Class II sanitary landfill. It was constructed in the early 1990's and is permitted to receive construction debris and spent foundry sand. This landfill is being operated and maintained per permit conditions. <u>ENSR does not recommend investigative activities related to the New Landfill</u>.



# M.4.5 Sprayfields

ENSR did not identify any past sprayfields during a review of the site's history and no sprayfields are currently located onsite. <u>ENSR recommends no further investigation.</u>

#### M.4.6 Incinerators

For the purposes of this report, incinerators, boilers, and furnaces were assigned to AOC-57 and shown on Figure M-9. Based on a review of historical documents ENSR identified seven possible incinerator locations, including three previously identified incinerator sites (AOC-23, -33, -34).

Two references were found regarding incinerators in the foundry area. According to a 1922 document, an incinerator was located between Buildings #1 and #N. A document from 1971 indicates that an incinerator was also located east of Building #4. Based on sampling conducted to date, which indicates PAH and metals impacts in this vicinity, impacts from these incinerators – if any – have been addressed as part of AOC-17. As such, no additional investigation is recommended.

In the northeastern part of the site, an incinerator was located near the Spray Pond and has been investigated as AOC-23. Another incinerator, formerly located near the Spray Pond southwest of Building #56 was investigated as AOC-34.

Three references were reviewed regarding incinerators in the general vicinity of Building #17. One was located northeast of Building #17 and has been investigated as AOC-33. The two remaining incinerators located east of Building #17 and southeast of Building #17, respectively, have not been investigated. However, based on sampling conducted to date in or near Building #17 in support of investigation of AOC-16, impacts related to these former incinerators have been addressed.

Additional fuel combustion activities occurred in many other locations at the site and were also included in AOC-57 and shown on Figure M-9. These included the operation of boilers, ovens, and furnaces in support of various foundry and metal-working processes. These operations were conducted indoors and were vented via chimneys or stacks to the outside. As such, ENSR proposes no further investigation with respect to the indoor operation of these pieces of equipment and that emissions would be covered in Section M.3.3, specifically, that previously conducted soil sampling as well as additional sampling proposed herein, will address potential impacts related to these features.

#### M.4.7 Historic Fill or any other Fill material

A description of site filling activities can be found in Appendix L. Fill that was not previously identified was assigned to AOC-58 and a map of known fill locations is included as Figure M-10. <u>Based on investigative activities conducted to date in the Old Landfill (AOC-29) and in other areas of the site as</u>



well as additional investigations proposed in this report, impacts related to the placement of fill, specifically spent foundry sand, will be addressed. ENSR recommend no additional investigation.

#### M.4.8 Open Pipe discharges

No documentation was reviewed by ENSR to indicate there were open pipe discharges at the IR site. No further investigation is recommended.

#### M.5 Other Areas of Concern

#### M.5.1 Electrical Transformers & Capacitors

As shown on Figure M-1, ENSR identified 92 areas that potentially housed one or more electrical transformers or capacitors that may have contained PCBs. For the purposes of this report, these transformers were assigned to AOC-49. Based on the current SPCC regulations, IR has a current inventory of oil containing equipment that includes 90 separate transformers with their current status (see Site History Report Table 4). As shown on Figure M-1, current and historical transformer locations are spread throughout the facility. Only one historic transformer location has been investigated (AOC-1) during previous investigative activities (see Appendix E). Soil analytical results from this AOC indicated the presence of TPHC and PCB in excess of applicable soil cleanup criteria. It is possible that other transformers currently or formerly present at the facility may also have caused impacts. However, individual sampling locations are not appropriate in this case. investigative activities and activities proposed in this report to address other AOCs will address the potential impacts of these former AOCs. Additionally, based on known impacts across the site, all of these locations will be deed restricted. The only area in which no sampling has been proposed or already conducted is the current main transformer area north of the Spray Pond. Therefore, ENSR recommends a limited soil investigation in and around this transformer area to document soil quality at and near the surface.

#### M.5.2 Hazardous Material Storage or Handling Areas

As shown on Figure M11, ENSR identified five storage areas where potentially hazardous material may have been stored or handled and assigned such areas that were not previously identified to AOC-60. (Other storage areas have been described in Section M.2.1.). On the northeast corner of Building #4, gas cylinders were stored. It is unknown what kind of gas these cylinders contained. Similarly, outside of Building #251, gas cylinders of Mapp gas were stored. Building #12 contained an area each for acid storage and caustic storage at its northeast corner. A solvent storage shed was located immediately south of Building #9.

Additionally, a hazardous waste storage shed is located east of Building #12. The hazardous waste storage shed (AOC-27) has a concrete floor and a spill collection sump, is regulated under RCRA, and



is inspected weekly. Numerous samples have been collected in its vicinity to investigate nearby AOCs. Additionally, NJDEP has concurred with the recommendation of No Further Action in 1994. <u>As such ENSR recommends no further investigation for this AOC</u>.

Any potential releases from the gas cylinder storage locations would not generate impacts to soil or groundwater. <u>As such, no further investigation is recommended for these AOCs.</u>

Any releases of acidic or alkaline material from inside Building #12 would have been contained inside the building on the concrete floor and treated in the neutralizer pit. <u>ENSR does not recommend additional investigation for hazardous material storage inside Building #12.</u>

The presence of a former solvent storage area south of Building #9 may represent a potential source area for chlorinated solvents discovered in groundwater south of the facility. <u>ENSR recommends an investigation in this area to determine if a release has occurred.</u>

#### M.5.3 Waste Treatment Areas

No outdoor waste treatment areas were uncovered as part of this investigation. Several potential indoor waste treatment locations were identified and addressed in Section M.6.2. <u>No further investigation is recommended regarding waste treatment areas</u>.

#### M.5.4 Discolored or Spill Areas

As observed in aerial photographs of the facility, there are three current areas which appear discolored. One of these is located at the facility coal trestle which is being investigated as AOC-46. A second area of discoloration was identified at the location for former chip location AOC-3F. A third area of discoloration was identified immediately west of the facility southern parking.

Because discolored areas associated with the Coal Trestle and former Chip Pad location 3F are being addressed as AOCs 46 and 3F, respectively, no additional investigation is recommended. However, since no sampling activities have been conducted in the discolored area west of the facility's southern parking lot, ENSR recommends that two soil borings be advanced in this area to assess the potential impacts in this area.

#### M.5.5 Open Areas Away From Production Areas

One facility drawing from 1966 features the schematics for a testing facility east of Building #16. For the purposes of this report, the area is assigned to AOC-60. The schematic indicates that the area is a concrete pad measuring 132 feet by 88 feet, and features four recessed boxes measuring 8 feet by 8 feet by 8 feet deep. Plans for the boxes indicate that they contain three feet of gravel, and no concrete



floors. An object resembling this test area appears on the 1974 aerial photograph as an area along the facility eastern fence-line adjacent to the eastern farm field, approximately half way between the facility's northern property line and the bulk oil storage tank farm. The test area is absent from the 1981 aerial photograph. The exact use of this area and the materials used and stored there are unknown.

Since no previous investigations have addressed this location, ENSR proposes one soil boring to be conducted in the vicinity of the former test facility east of Building #16.

#### M.5.6 Areas of Stressed Vegetation

A Baseline Ecological Evaluation (BEE) was conducted for the southern portion of the subject property in 2002 and submitted to NJDEP in July 2002. Another BEE was conducted for the main plant area in August 2004, and this report is in production. Neither BEE identified any areas of stressed vegetation. As such, no additional investigation is recommended.

#### M.5.7 Underground Piping Including Industrial Process Sewers

Over its history, the facility has been served by sanitary and storm water systems. Pipe systems also have existed associated with the delivery of drinking water, cooling water, oil, gasoline, paraffin, air, acetylene, condensate, and steam.

Some of these utilities were conveyed across sections of the site in concrete lined subway utility corridors. Sections of these subways were inspected by ENSR in the summer of 2004. Generally the integrity of the concrete in these subways was good, and no staining was observed.

For the purposes of this report, subsurface utilities have been assigned to AOC-53. Section 2.3.7 of the Site History Report and Appendix J discusses subsurface utilities in greater detail.

The underground piping which has existed site-wide over its 100 year history is very extensive and precise locations of these pipes are not known. Nevertheless, most of the subsurface utilities are associated with current or former buildings onsite, and the soil sampling locations associated with environmental investigative activities are generally near to current or former piping runs. Therefore the environmental condition of the current and former piping runs is generally defined by the existing soil samples onsite.

ENSR does not believe individual investigation and sampling is warranted for these utilities. Previous investigations and activities proposed in this report to address other AOCs will address the potential impacts of the former subsurface utilities. Further, based on known impacts, it is likely that nearly all of the locations of former process piping will be deed restricted. As such, ENSR recommends no further investigation.



### M.5.8 Compressor Vent Discharges

Operations in multiple buildings onsite used compressors, though it is not documented where these compressor vents discharged or how the discharges were managed. Given the extensive piping network onsite, it is likely that compressor vent discharges were directed to drain pipes which would have transported compressor vent discharges to the sanitary or storm sewer system. Storm sewer outfalls are covered in this document under sections 2.3.7, 2.3.8, 2.3.9, and N.3, and are assigned to AOC-59. Additionally, previously identified AOC-19 (Air Trappage Tank) was a receptacle for compressor discharges from the compressors in the Power House. This AOC is being addressed separately.

Since no information is available regarding the disposition of other compressor vent discharges, and since conveyance of these discharges to the drainage network is covered under other sections of the report, ENSR recommends no further investigation for compressor vent discharges.

#### M.5.9 Non-Contact Cooling Water Discharges

Non-contact cooling water originating from the boilers, condensers, and possibly from manufacturing and testing activities has been discharged to the spray pond over the plant's history. No other discharge locations for non-contact cooling water are known.

The Spray Pond is covered elsewhere in this document in sections 2.3.9 and N.3 and is being addressed as AOC-30. Since the Spray Pond (AOC-30) is the only known receptacle for non-contact cooling water, <u>ENSR proposes no further investigation with respect to non-contact cooling water</u>. It is possible that the other ponds and ephemeral stream may have received such discharge, which would therefore be addressed as AOC-31, 32, and 37.

# M.5.10 Areas Which Receive Flood or Storm Water from Potentially Contaminated Areas

Facility stormwater either percolates into the soil locally or it ultimately arrives at either one of two ponds, the Spray Pond and Inverse Ponds system on the eastern side of the facility or the Stormwater Detention Basin at the western side of the facility. These pond outfalls are regulated and sampled under NJPDES and these ponds are discussed elsewhere in this report in sections 2.3.9 and M.3.

The main plant area is situated at the top of a hill, and no part of the facility is subject to flooding.

Some overland flow has been observed in the vicinity of AOC-2 and may have transported some of this impacted soil southward. However, since this AOC will be excavated and disposed offsite, and post-excavation soil samples will be collected, potential migration of impacts will be addressed during remedial activities at AOC-2. As such, ENSR recommends no additional investigation.



#### M.5.11 Active or Inactive Production Wells

Previously identified wells have been addressed as AOC-44, while those not previously addressed were assigned to AOC-60 for the purposes of this report. Three production wells are known to have existed onsite. The oldest was drilled in 1903 and retrofitted in 1915, and is (or was) located between Buildings #8 and #12. It appears to have been taken out of service in the 1970's or 1980's, but no formal abandonment documentation is known to exist, and its exact location is not known at this time. ENSR recommends a limited investigation in the vicinity of this well to determine whether it has been abandoned. If the well is present, ENSR recommends that it is evaluated for potential monitoring.

The second production well was drilled in 1934, and currently supplies the facility with potable water. Water treatment via an air stripper is necessary to remove trace amounts of chlorinated solvents from the water withdrawn from this well. No additional action is recommended at this well. This well may be used for monitoring purposes in the future.

The third well drilled in 1974, was tested but was never fully placed online due to the discovery of freephase floating product in the well. It remains onsite and is used for monitoring purposes in support of ongoing onsite groundwater investigative activities.

Additionally, at least one potential industrial well was identified in Building #12. ENSR recommends further investigation into the continued existence of this well.

#### M.6 Building Interior Areas with Potential for Discharge Into the Environment

#### M.6.1 Loading or Transfer areas

ENSR identified six loading or transfer areas during review of historic documents and were assigned to AOC-60. Railroad sidings existed by most of the major buildings, and depressed track was documented entering many buildings indicating that loading/unloading of rail cars was a likely operation.

Of the six areas identified by ENSR, three were located in the Cameron area. <u>As previously indicated, due to the identification of several potential AOCs in the former Cameron area, ENSR has proposed grid sampling to address any remaining potential impacts in this area.</u>

The remaining identified areas were located at the main facility site near Buildings #11 and #12. Based on sampling conducted to date and additional sampling proposed in this report, potential impacts related to the operation of loading and transfer areas in the main facility area will be addressed. No additional investigation is recommended.



#### M.6.2 Waste Treatment Areas

No specific facility was dedicated to treating waste, but areas in buildings did contain waste treatment equipment. As previously described, Building #12 contained a neutralization area used to neutralize acid and base waste prior to discharge to the sanitary sewer system. The same building also contained an ultrafilter (AOC-28) that separated oil from wastewater. Several other oil-water separators have also been documented and addressed in Section M.1 and were assigned to AOC-54. In addition, a sonic stripper, possibly part of a water treatment system, was identified in Building #11, and was assigned to AOC-60. Since all potential waste treatment areas have been addressed in other locations of this Appendix or as separate AOCs that have been previously investigation, ENSR recommends no further investigation.

#### M.6.3 Boiler Rooms

ENSR identified the existence of two Boiler Rooms during the facility document review. These areas were assigned to AOC-57 for the purposes of this report.

Building #12, which served as the facility power house for the duration of operations, and Building #251, which served as the Cameron Power House for a short time in the 1910's and 1920's, contained boilers used in steam generation. Steam was used at the facility buildings for heat and was used during earlier powerhouse operations to drive turbines to generate electricity. Boilers were housed in Building 12 itself, and immediately outside Building 12 along its eastern wall. Since several AOCs have been identified and investigated in the area surrounding Building #12, ENSR does not recommend additional investigation in this area.

Additionally, regarding the Cameron area boiler room, ENSR has recommended grid-based soil sampling throughout the former Cameron area due to the identification of many AOCs that have not been addressed.

#### M.6.4 Air vents and ducts

Based on historic maps of various site buildings, it appears that most operations buildings had multiple air vents, ducts, stacks, or similar features. These areas were assigned to AOC-59 for the purposes of this report. At this time, only a few roof vents are operated under air pollution control permits held by Flow Serve. Based on the sampling conducted to date as well as proposed additional sampling contained in this report, potential impacts from historical operation of air vents and ducts will be addressed. No additional investigation is proposed.



# M.6.5 Hazardous Material Storage or Handling Areas

Two hazardous waste storage sheds located east of Building #12 and south of Building #9, respectively were assigned to AOC-60 and are addressed in Section M.5.2. <u>Since these areas are addressed in other section of this Appendix or as separate previously investigated AOCs, ENSR recommends no further investigation.</u>

#### M.7 Any Other Site-Specific Area of Concern

#### **M.7.1** Mine

Facility records indicate that there was a mine near the northeastern corner of the iron foundry (Building #4). For the purposes of this report, the mine was assigned to AOC-48 and is shown on Figure M-3. Mining activity appears to have begun onsite between facility construction in 1903 and 1913, based on the appearance of mine-associated buildings on the facility's 1913 Factory Insurance Association (FIA) map from that year. Mining operations were conducted solely for testing of equipment and for research and development of new equipment. Evidence suggests that mining and geology students from nearby Lafayette College studied the mine.

Mine maps, previously supplied to NJDEP, indicate that the first tunnel was about forty feet below grade, and that a later extensive tunnel network was about eighty feet below grade. Cross sections of the mine works indicate that the forty-foot deep tunnel was used for powder storage (presumably blasting powder).

No mining is believed to have been done past the 1950's, and maps from that time indicate that at least a portion of the mine works had collapsed.

No records exist for a formal closure of the mine. No surface expression exists of the former shaft or any ventilation shafts. It is assumed that the mine was out of service either at the time of the demolition of the nearby iron foundry (Building #4) in the 1980's or prior to this date. Interpretation of aerial photography available for the site suggests that the mine was probably closed between 1974 and 1981, when the mine-associated buildings were demolished.

ENSR recommends additional investigation of the former site mine to determine how it was abandoned.

#### M.7.2 X-Ray and Radiation Sources

Three areas were found to have contained sources of X-rays at the facility and are shown on Figure M-2. These AOCs, assigned to AOC-47, include the former Hospital and Dispensary (Building #27), the



former Radiograph Building (#60), and a former dispensary area in Building #20. These areas used X-ray machines for human and casting diagnostics. Based on a review of x-ray equipment products, it was uncovered that X-ray machines generate x-rays through the stimulation of a non-radioactive tungsten source and that no radioactive source material would have been used in these operations. To verify, ENSR has performed a radiological sweep of these areas using a Geiger counter and did not uncover evidence of residual radiation. Results will be reported in a forthcoming submission. <u>ENSR</u> recommends no further investigation.

#### M.7.3 Railroad Tracks

Railroad tracks (assigned AOC-55) traversed the entire main plant area starting at the time of facility construction. Nearly every major facility building was serviced by railroad sidings and by associated railroad tracks. Presently, most of the site's former railroad tracks have been removed, a process which began in the 1950's and 1960's, when trucks began to replace railroads as the primary means of transporting goods to and from the site. Based on historical evidence and site observations, tracks may have been constructed on fill material and may have spent foundry sand, coal dust and fragments, and ash/cinder components. Additionally, previous interviews suggest that waste oil and solvents may have been used as weed suppression along rails at the site.

Based on the sampling conducted during previous investigations as well as the sampling proposed in other sections of this report, potential impacts related to the railroad tracks formerly present across the site will be addressed. As such, no additional investigation is proposed.

#### M.7.4 Metals Plating Areas

ENSR identified at least six areas where metal plating occurred during its file review. These areas were assigned to AOC-56 and are shown on Figure M-8. According to reviewed documents, the processes involved cadmium, copper, and chromium plating, as well as acid etching areas. These areas were found to have existed in four buildings associated with the Drill and Cameron divisions. Building #14 had three areas related to plating: one combined copper and cadmium plating, another used chromium, and the other was an acid etching room. Building #15A possibly contained a copper plating area and a vapor degreaser. Documents suggest that Building #20 had a plating room, but more specific information was unavailable. In the Cameron area, a plating shop was identified in Building #251, though it is not known what kind of plating occurred at that location.

A NFA letter has been conditionally granted for Building #14, which has confirmed impacts of PCE, TCE, Arsenic, Beryllium, Lead, and Thallium. Cadmium and chromium impacts were not identified during historical sampling. As such, no further investigation is recommended. However, this area will require a deed restriction.



Plating operations previously conducted in the Cameron area will be addressed by grid based sampling proposed for that area. <u>No specific investigation into the former plating operation is recommended.</u>

Since sampling has been conducted at the perimeter of Building #15 and impacts appear the same on either side, ENSR recommends addressing Building #15 as part of the southern portion of AOC-16, which overlaps Building #15. However, since no sampling has been conducted in the vicinity of Building #20, additional investigation is warranted. ENSR recommends a grid based soil investigation to assess soil quality over this area.

# M.7.5 Cleaning and Degreasing Areas

ENSR identified at least eleven areas that were labeled with cleaning or degreasing functions on reviewed documents. These areas were assigned to AOC-60 for the purposes of this report. Two casting and cleaning sheds were located in the northwest area of the site, northeast of Building #3 and in Building #30 (the "Casting Cleaning" building). Three areas were located in the southeast part of the site. A parts cleaning area and a "Drain and Clean" area were located in Compressor Building #11. Building #8 also had a skid wash west of the paint booth. In the northeast part of the site, mainly indications of metal washing and degreasing were found. Degreasers were located in Buildings #14 and #15, while a drill cleaning room was located in Building #15. A "washing machine" was located in Building #17. On the Cameron site, a casting cleaning shed was located along the western wall of Building #252, and the maintenance department in Building #251 may have had cleaning functions.

As previously indicated, due to the identification of several potential AOCs in the northern part of the former foundry area, ENSR has proposed grid sampling to address any remaining potential impacts in this area around Buildings #3 and #30. Based on the sampling conducted during previous investigations as well as the sampling proposed in other sections of this report, potential impacts related to the remaining cleaning and degreasing operations, which were present across the site, will be addressed. As such, no additional investigation is proposed.

#### M.7.6 Gun Club

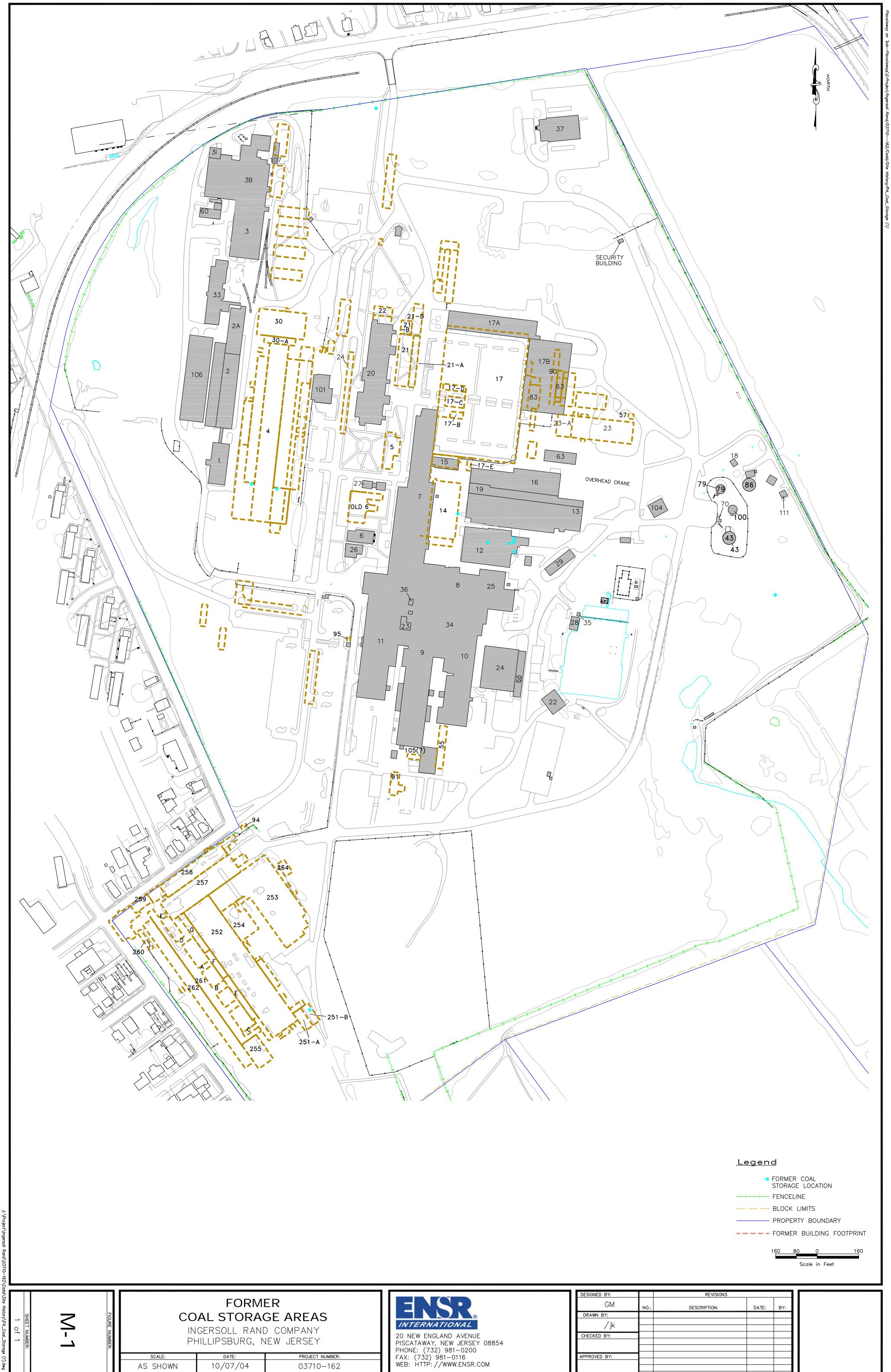
A building identified during portions of the site's operation history as a Gun Club, Garden House, and Seed House was located northeast of Building #17 according to a 1904 document. No further information was found about operations conducted at this location. It is unknown what operations were conducted at this location. However its use as a Gun Club may indicate its use as a firing range and its inclusion as an AOC (assigned to AOC-60). Previous soil sampling conducted in this area associated with AOCs-3, -4, -16, and -33 did not identify the presence of lead in excess of applicable criteria and other impacts are being addressed with nearby AOCs. <u>As such, ENSR recommends no</u> additional action.

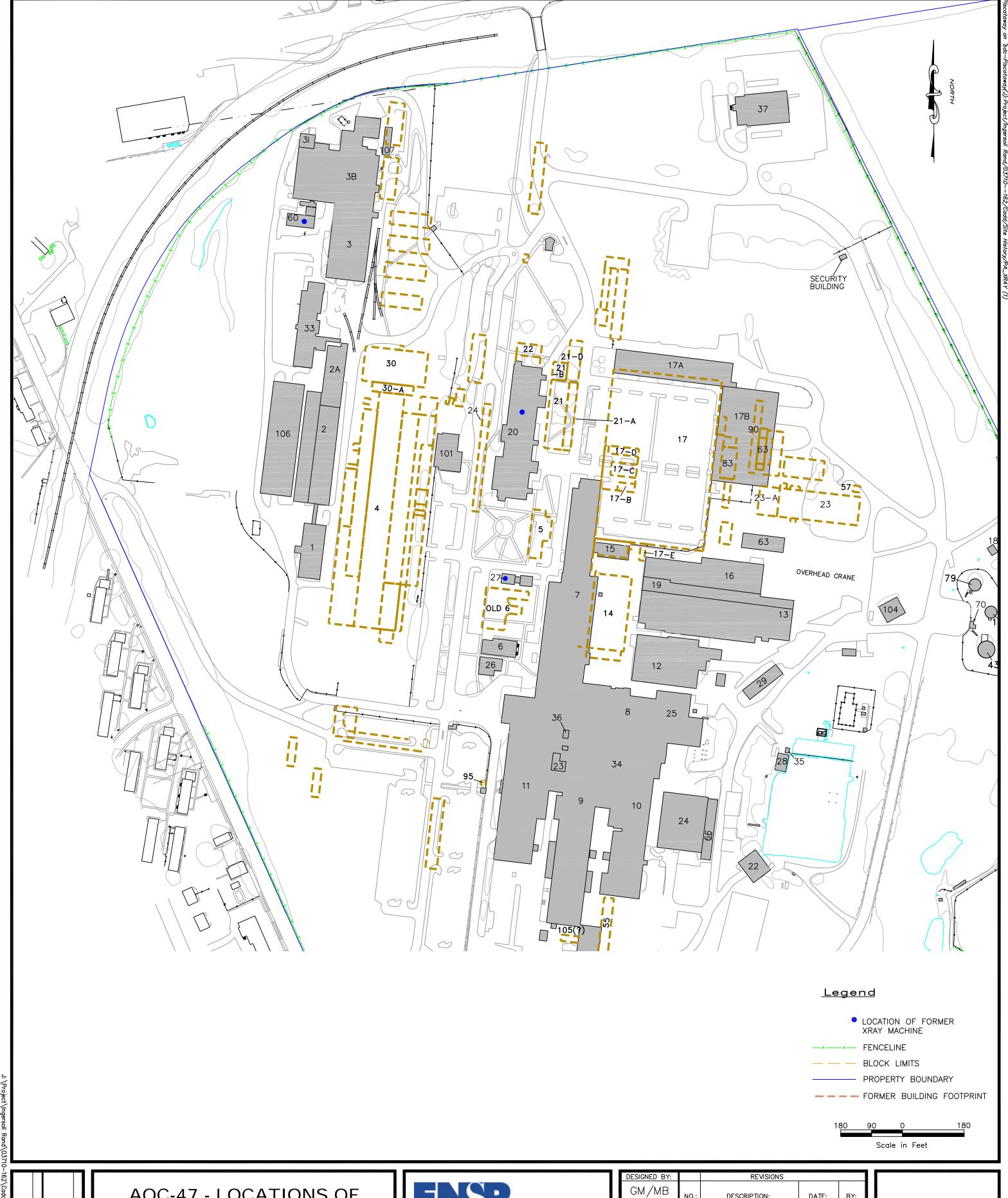


# M.7.8 Other Building and Process Areas with Potential to Discharge to the Environment

ENSR has identified numerous areas including hydraulic mechanisms, maintenance areas, pickling (corrosion removal) areas, metal working and forging areas, painting areas, testing areas, metals reclaiming and collection areas, nitrogen gas generation areas, acetylene generation areas, a gasoline generation area, several laboratories, several pits not related to drainage or wastewater disposal, oil handling areas not otherwise described, a "silver generation" area, and a possible quarry location. These areas were assigned for the purposes of this report to AOC-60, except in the case of furnaces, which were assigned to AOC-57.

Based on the sampling conducted during previous investigations as well as the sampling proposed in other sections of this report, potential impacts related to all of these possible AOCs will be addressed. As such, no additional investigation is proposed.





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# AOC-47 - LOCATIONS OF FORMER XRAY MACHINES

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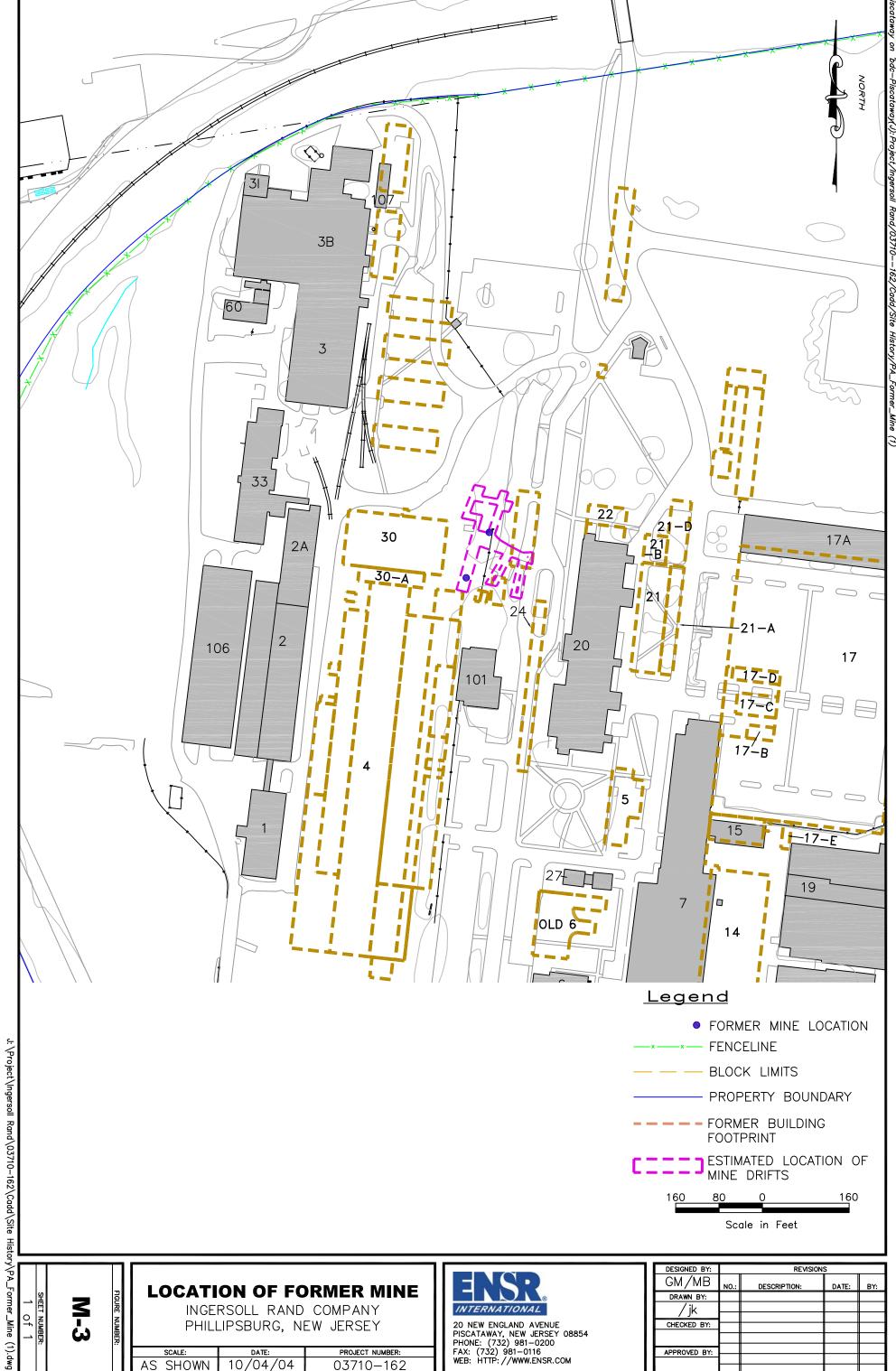
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# **LOCATION OF FORMER MINE**

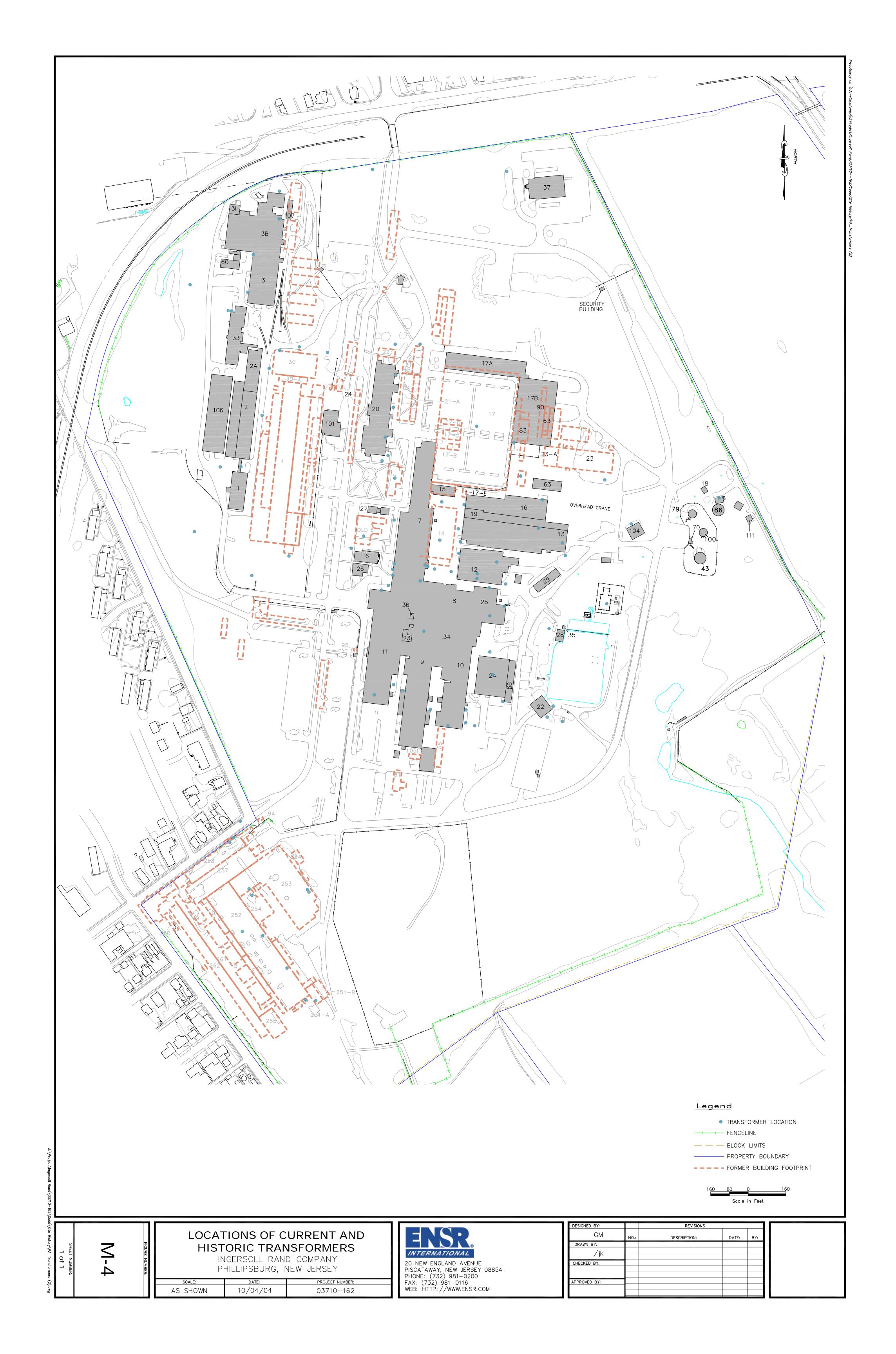
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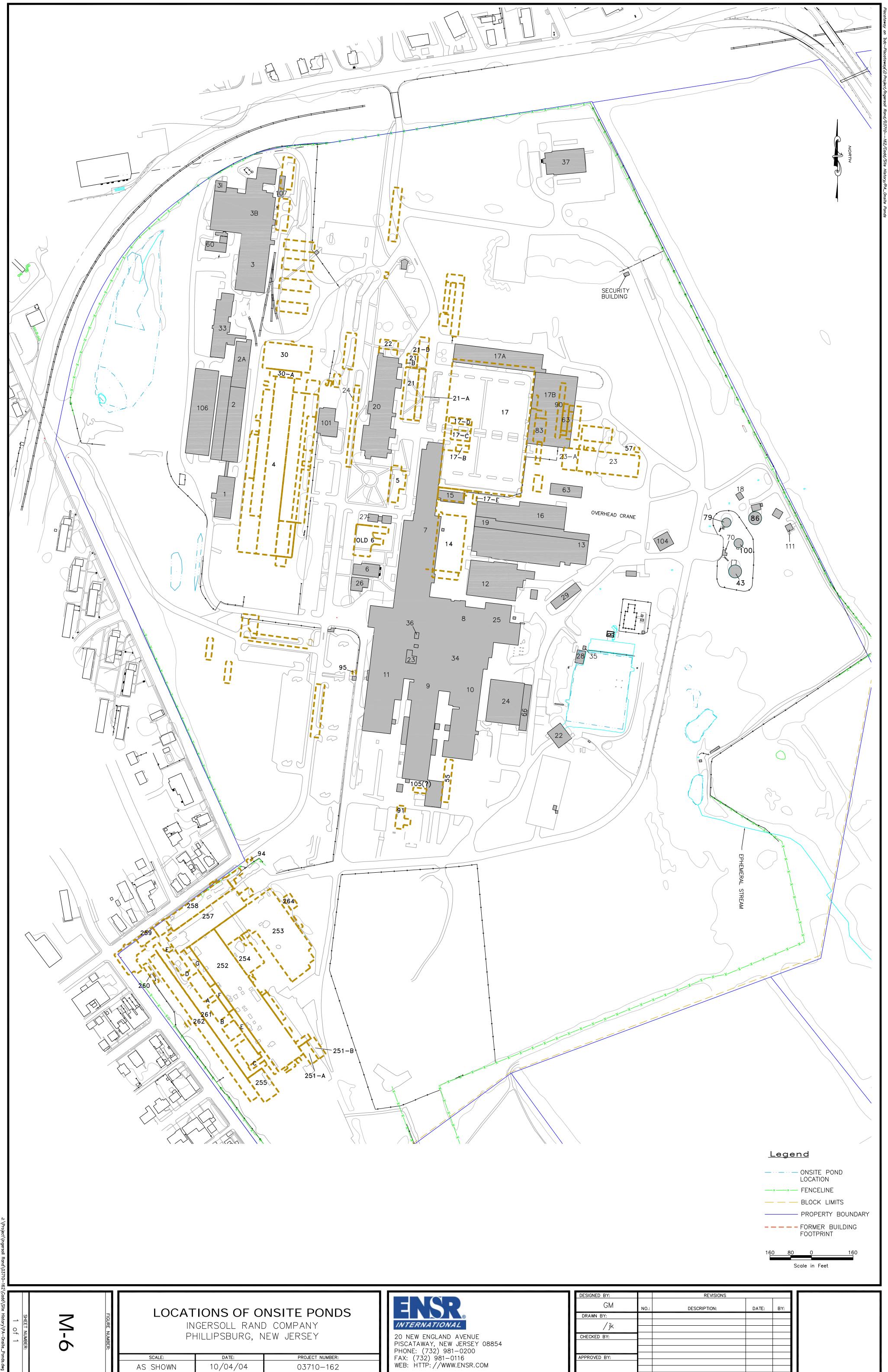




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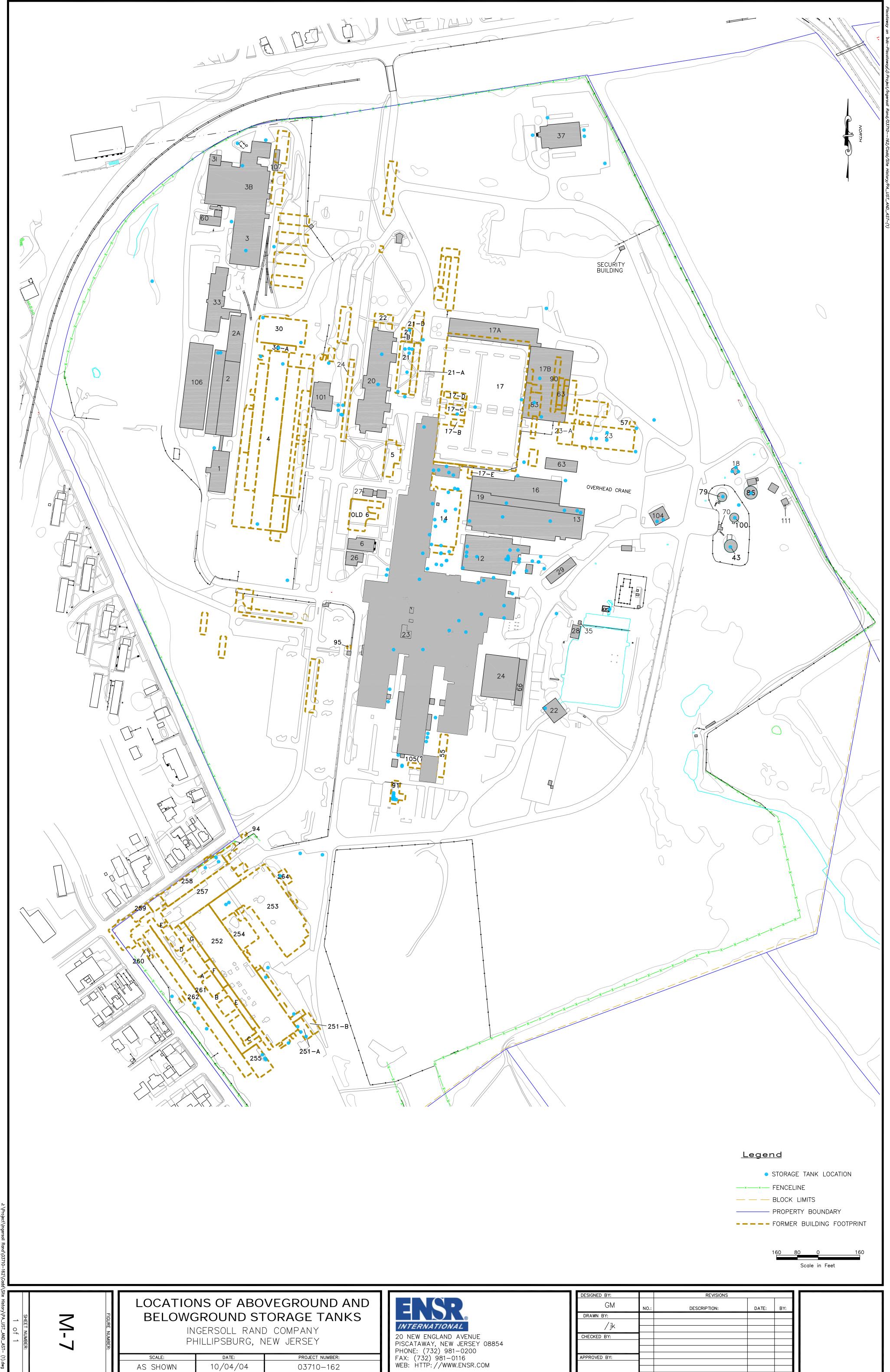
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